REMARKS

Claims 1-35 were pending in this application. Claims 4, 27 and 30 have been canceled. Claims 1-3, 5-26, 28-29 and 31-35 will remain after this amendment.

Applicants have amended the specification and Figs. 3, 4 and 6 to correct informalities. No new matter has been added.

The Office Action objected to the title as being non-descriptive. The title has been amended to "ARRAY SEARCHING OPERATIONS WHICH FETCH AND COMPARE MULTIPLE ARRAY ELEMENTS" Applicants respectfully request removal of the objection.

Claims 12 and 13 were rejected under 35 USC 112 as being indefinite. Claims 12 and 13 have been amended to correct antecedent basis as suggested by the Office Action.

Claims 1, 2, 4, 6, 9 and 10 - Kobayashi

Claims 1, 2, 4, 6, 9 and 10 stand rejected under 35 USC 102(b) as being anticipated by Kobayashi (4,774,688).

Independent Claim 1 has been amended to clarify the claimed method. Dependent Claims 3 and 5-10 have also been amended. Claim 4 has been canceled.

Kobayashi does not disclose "receiving N/M machine instructions directing a processor to search an array of N data elements, where N and M are integers greater than one," as recited in amended Claim 1. Kobayashi discloses "determination of minimum and maximum values from a group of N data elements." Kobayashi Summary. But Kobayashi does not disclose "N/M machine instructions," as recited in Claim 1. Kobayashi teaches away from Claim 1 by stating "[I]n determining the minimum or maximum of N data elements, it is only necessary to execute the MIN or MAX operations N-1 times." Kobayashi Abstract.

In addition, Kobayashi does not teach "<u>concurrently</u>
<u>comparing</u> the <u>M data elements</u> to <u>M corresponding current extreme</u>
<u>values</u>," as recited in amended Claim 1. Kobayashi teaches "MAX"
and "MIN" instructions, which only compare two values and
determine which value is larger or smaller. Kobayashi, column
4, lines 24-28.

For these reasons, amended Claim 1 and dependent Claims 2-3
and 5-10 should be allowable over Kobayashi.

Claims 13-15 - Oberman

Claims 13-15 stand rejected under 35 USC 102(b) as being
anticipated by Oberman (WO 9923548). Independent Claim 13 has
been amended to clarify the claimed method. Dependent Claims
14-18 have also been amended.

Oberman discloses a "maximum value instruction" which finds
a maximum value between "first vector portions" of two values
and finds a maximum value between "second vector portions" of
two values. Pages 51-52 and 55 and Fig. 50. Oberman also
discloses a "minimum value instruction" which finds a minimum
value between "first vector portions" of two values and finds a
minimum value between "second vector portions" of two values.
This is different than Applicants' amended Claim 13.

Amended Claim 13 recites:

"substantially comparing the even element of the pair
<u>with an even extreme value;</u>

if the even element of the pair exceeds the even extreme
value, storing the even element of the pair as the even
extreme value;

<u>concurrent with</u> said comparing the even element of the
pair with the even extreme value, comparing the odd element of
the pair <u>with an odd extreme value</u>;

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if the odd element of the pair exceeds <u>the odd extreme</u> <u>value</u>, <u>storing the odd element of the pair as the odd extreme</u> <u>value;</u> and

substantially fetching and comparing remaining pairs of data elements of the array until all of the data elements of the array have been processed."

Oberman does <u>not</u> disclose an "even extreme value" and an "odd extreme value," as recited in amended Claim 13. Oberman does not disclose "<u>comparing</u> the <u>even element</u> of the pair with an <u>even extreme value</u>; if the even element of the pair exceeds the even extreme value, storing the even element of the pair as the even extreme value; concurrent with said comparing the even element of the pair with the even extreme value, <u>comparing</u> the <u>odd element</u> of the pair with an <u>odd extreme value</u>; and if the odd element of the pair exceeds the odd extreme value, storing the odd element of the pair as the odd extreme value," as recited in amended Claim 13. Oberman only teaches an instruction to "determine the maximum and minimum values <u>from</u> <u>each input pair</u>." Page 55, lines 30-35. Oberman does not teach finding an extreme value for even elements of an array of elements and finding an extreme value for odd elements of the array.

Oberman mentions a "maximum integer value 3321" and a "minimum integer value 3322" on page 55, lines 3-4, but Oberman states "maximum integer value 3321 and minimum integer value 3322 are <u>used for clamping f2i instruction results as needed</u>." Oberman does <u>not</u> teach using the "maximum integer value 3321" and "minimum integer value 3322" to compare to even and odd elements. Oberman does not teach an "<u>even</u> extreme value" and an "<u>odd</u> extreme value," as recited in amended Claim 13.

For these reasons, amended Claim 13 and dependent Claims 14-18 should be allowable over Kobayashi.

For Claim 15, the Office Action referred to the elements 3008A and 3008B in Kobayashi as disclosing the first and second "accumulators" in Claim 15. The elements 3008A and 3008B only store output values for two values 3004A, 3004B, not for all even elements and all odd elements of an array, as recited in Claim 15.

Claim 3 - Kobayashi and Stroustrup

Claim 3 stands rejected under 35 USC 103(a) over Kobayashi in view of Stroustrup. Stroustrup discloses pointers that point to elements of an array. However, Stroustrup does not disclose "pointer registers" that "store addresses of extreme data quantities in the array of N data elements," as recited in Claim 3.

Furthermore, the combination of Kobayashi and Stroustrup does not teach the method of amended Claim 1 and Claim 2, from which Claim 3 depends. Kobayashi and Stroustrup do not teach "receiving N/M machine instructions directing a processor to search an array of N data elements, where N and M are integers greater than one; and executing each machine instruction by: retrieving M data elements in a single fetch cycle; concurrently comparing the M data elements to M corresponding current extreme values; and updating a set of M references based on said comparing," as recited in Claim 1.

For these reasons, Claim 3 should be allowable over Kobayashi and Stroustrup.

Claims 5, 7, 8, 11, 12, 19, 20-23, 26-31 and 33-35 - Kobayashi and Oberman

Claims 5, 7, 8, 11, 12, 19, 20-23, 26-31 and 33-35 stand rejected under 35 USC 103(a) over Kobayashi in view of Oberman.

Claims 5, 7 and 8 depend from amended Claim 1, which is not taught by Kobayashi, as stated above. Similarly, Oberman does not teach "receiving N/M machine instructions directing a processor to search an array of N data elements, where N and M are integers greater than one; and executing each machine instruction by: retrieving M data elements in a single fetch cycle; concurrently comparing the M data elements to M corresponding current extreme values; and updating a set of M references based on said comparing," as recited in Claim 1. The "PFMAX" and "PFMIN" instructions on page 51 of Oberman only compare first and second parts of two values to each other, not "M corresponding current extreme values," as recited in Claim 1. As stated above, Oberman does not teach "concurrently comparing the M data elements to M corresponding current extreme values," which is recited in Claim 1, from which Claims 5, 7 and 8 depend. Thus, Claims 5, 7 and 8 should be allowable over Kobayashi and Oberman.

Claim 11 has been amended to include limitations from original Claim 12.

For Claim 11, the Office Action acknowledges that Kobayashi does not teach "issuing N/M machine instructions to a processor, wherein the processor is adapted to process M data elements in parallel; and analyzing results of the machine instructions to identify the extreme value for the array," as recited in Claim 11. The Office Action relies on Oberman for teaching Claim 11.

Oberman teaches an instruction to compare first and second parts of two values. However, Oberman does not teach "issuing N/M machine instructions to a processor, wherein the processor is adapted to process M data elements in parallel," where N is the number of data elements in an array, as recited in Claim 11.

Oberman also does not teach "concurrently comparing the M data elements to <u>corresponding M current extreme values</u>," as recited in Claim 11. As stated above, Oberman teaches an instruction to compare parts of two values to each other, not comparing M data elements to "corresponding M current <u>extreme values</u>," as recited in Claim 11.

Oberman also does not teach "updating <u>accumulators</u> and <u>pointers</u> associated with the M current extreme values based on said comparing," as recited in amended Claim 11.

Claims 19 and 20 have been amended to include limitations from Claims 11 and 12, respectively. Claims 19 and 20 should be allowable for the reasons stated above for Claim 11.

Claims 21-25 depend from amended Claim 19 and should be allowable for the reasons stated above.

Claim 26 has been amended to include limitations from Claim 19. Claim 26 and dependent Claim 28 should be allowable for the reasons stated above for Claim 19.

Claim 29 has been amended to include limitations from Claim 19. Claim 29 and dependent Claims 30-35 should be allowable for the reasons stated above for Claim 19.

<u>Claim 32 - Oberman and Stroustrup</u>

Claim 32 stands rejected under 35 USC 103(a) over Kobayashi in view of Oberman and Stroustrup. Claim 32 depends on Claim 31, which depends on amended Claim 29. As stated above, Oberman does not teach the system of Claim 29. Stroustrup teaches "pointers to an array." However, Stroustrup does not teach the limitations of Claim 29 that Oberman fails to teach, which are described above. Thus, Claim 32 should be allowable over Oberman and Stroustrup.

<u>Claims 16 and 17 - Oberman and Stroustrup</u>

Claims 16 and 17 stand rejected under 35 USC 103(a) over Oberman in view of Stroustrup.

Claims 16 and 17 depend from amended independent Claim 13, which is not taught by Oberman as stated above. Stroustrup teaches "pointers to an array." However, Stroustrup does not teach the limitations of Claim 13 that Oberman fails to teach, which are described above. Thus, Claims 16 and 17 should be allowable over Oberman and Stroustrup.

Claims 18, 24 and 25 - Oberman

Claims 18, 24 and 25 stand rejected under 35 USC 103(a) over Oberman. Claim 18 depends from amended independent Claim 13, which is not taught by Oberman as stated above. Claim 18 should be allowable over Oberman.

Claims 24 and 25 depend from amended Claim 19 and are believed to be allowable for the reasons stated above for Claim 19.

Applicants respectfully request that all claims be allowed. No fees are believed to be due at this time. Please apply any charges not covered or credits to Deposit Account No. 06-1050.

Respectfully submitted,

/BY
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_____
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